



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**BIOLOGY**

**0610/12**

Paper 1 Multiple Choice

**October/November 2010**

**45 minutes**

Additional Materials: Multiple Choice Answer Sheet  
Soft clean eraser  
Soft pencil (type B or HB is recommended)



**READ THESE INSTRUCTIONS FIRST**

Write in soft pencil.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

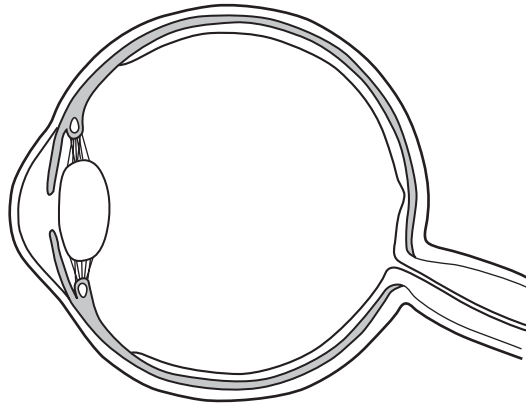
**Read the instructions on the Answer Sheet very carefully.**

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.  
Any rough working should be done in this booklet.

This document consists of **18** printed pages and **2** blank pages.

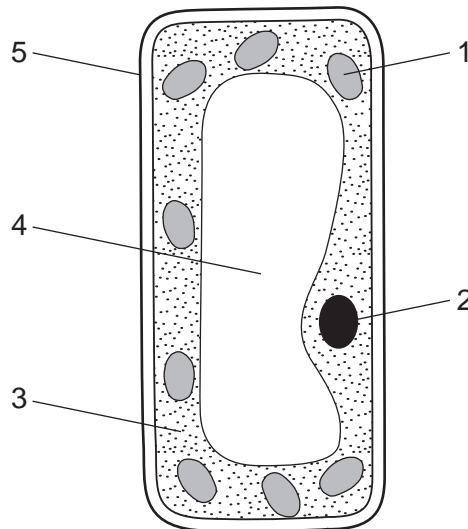


- 1 The diagram shows a structure found in the human body.



This is an example of

- A an organ.
  - B an organism.
  - C an organ system.
  - D a tissue.
- 2 The diagram shows a cell from a plant leaf.



Which parts are not found in animal cells?

- A 1 and 2
- B 2 and 3
- C 3 and 4
- D 4 and 5

3 Water is a good solvent.

What does this mean?

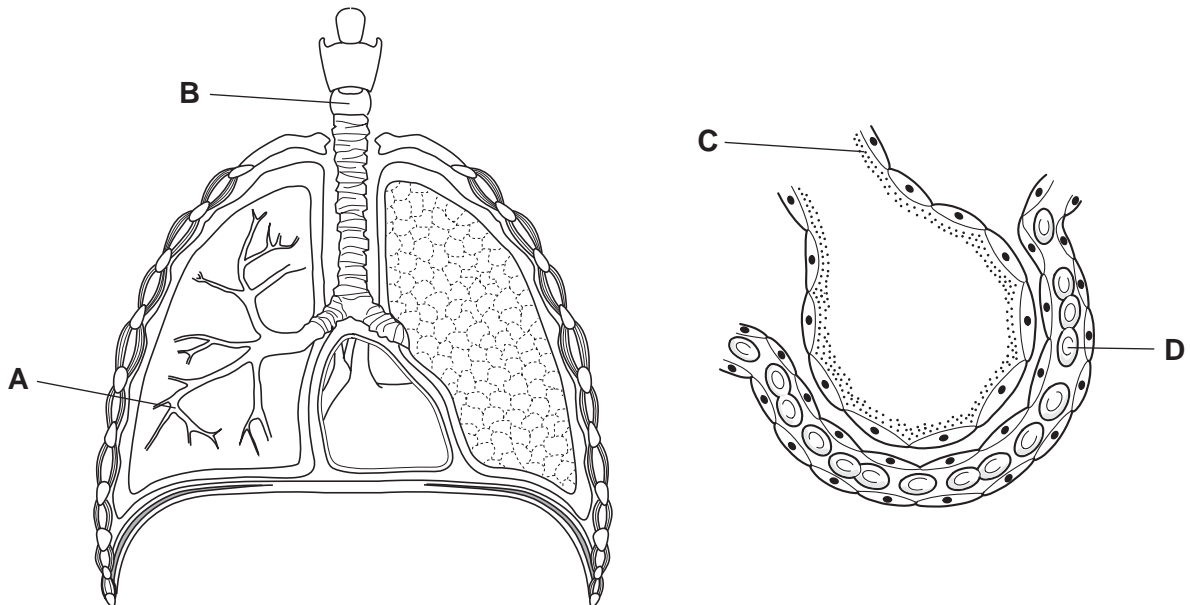
- A It dissolves well in many other substances.
- B It flows easily through vessels.
- C It is permeable to gases.
- D Many substances dissolve well in it.

4 Which system is used for naming species?

- A binomial
- B conservation
- C dichotomous
- D natural selection

5 The diagram shows the breathing system and a section of an alveolus surrounded by a capillary.

Which label shows a cell?



6 The table shows some characteristic features of four vertebrates.

Which vertebrate is a mammal?

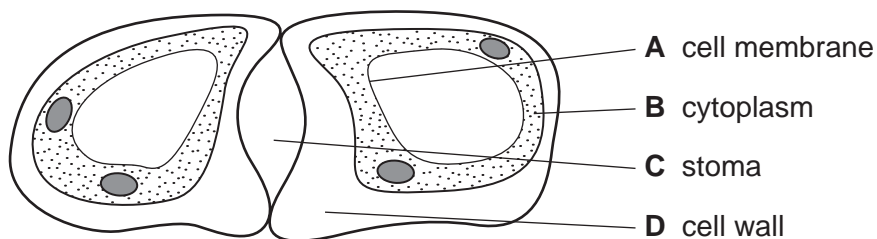
|          | feature |           |          |       |      | key                            |
|----------|---------|-----------|----------|-------|------|--------------------------------|
|          | scales  | lays eggs | feathers | wings | hair |                                |
| <b>A</b> | ✓       | ✓         | x        | x     | x    | ✓ = present<br>x = not present |
| <b>B</b> | x       | ✓         | x        | x     | x    |                                |
| <b>C</b> | x       | ✓         | ✓        | ✓     | x    |                                |
| <b>D</b> | x       | x         | x        | ✓     | ✓    |                                |

7 Which characteristic of living organisms can involve ingestion, absorption and assimilation?

- A excretion
- B growth
- C nutrition
- D respiration

8 The diagram shows a student's drawing of guard cells.

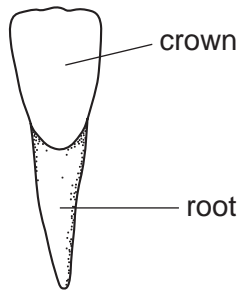
Which label line is **incorrect**?



9 Which substance is lost from the body by the kidneys, lungs and skin?

- A carbon dioxide
- B excess ions
- C urea
- D water

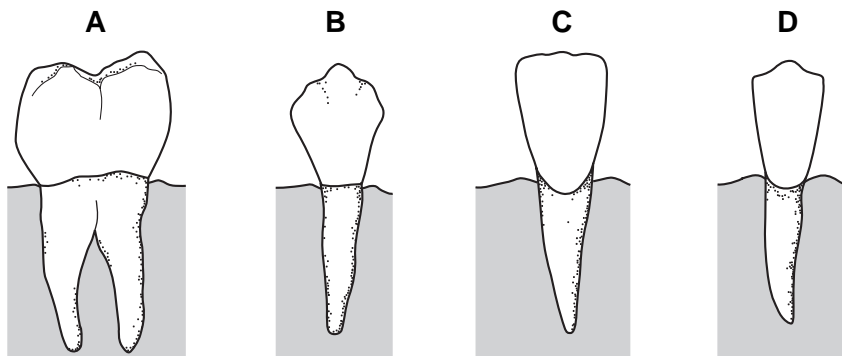
10 The diagram shows a type of tooth.



Use the key to identify the tooth.

- 1 double rooted tooth ..... go to 2
- single rooted tooth ..... go to 3
- 2 flattened crown ..... **A**
- deeply ridged crown ..... **B**
- 3 chisel shaped tooth ..... **C**
- cone shaped tooth ..... **D**

11 Which type of tooth is used for crushing food?



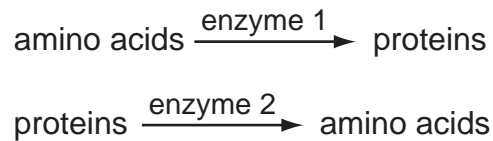
12 The table shows vitamin and mineral salt content of four foods.

| food | vitamin C | vitamin D | calcium | iron |
|------|-----------|-----------|---------|------|
| 1    | low       | high      | low     | low  |
| 2    | low       | low       | low     | high |
| 3    | low       | low       | high    | low  |
| 4    | high      | low       | low     | low  |

Which foods would stop a person from suffering from anaemia (lack of haemoglobin) and scurvy (bleeding gums)?

|          | anaemia | scurvy |
|----------|---------|--------|
| <b>A</b> | 1       | 2      |
| <b>B</b> | 1       | 3      |
| <b>C</b> | 2       | 4      |
| <b>D</b> | 3       | 4      |

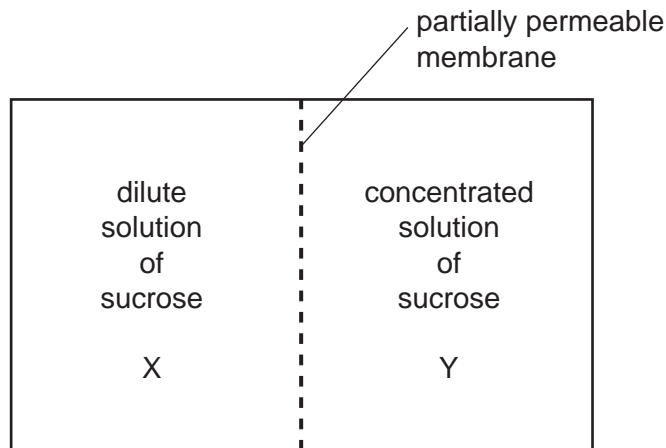
13 Two enzyme-controlled reactions are shown.



From these reactions, what deduction can be made about enzymes?

- A** Enzyme 1 has been changed to enzyme 2.
- B** Enzyme 2 slows down the production of amino acids.
- C** Enzymes can build up large molecules.
- D** Enzymes only break down large molecules.

- 14 The diagram shows two solutions that are separated by a partially permeable membrane.



In which direction will most water molecules move in relation to their concentration gradient?

- A** from X to Y against their concentration gradient  
**B** from X to Y down their concentration gradient  
**C** from Y to X against their concentration gradient  
**D** from Y to X down their concentration gradient
- 15 Six test-tubes were set up at different temperatures. Each contained identical solutions containing starch and amylase mixtures. The table shows the time taken for the reactions to finish in each test-tube.

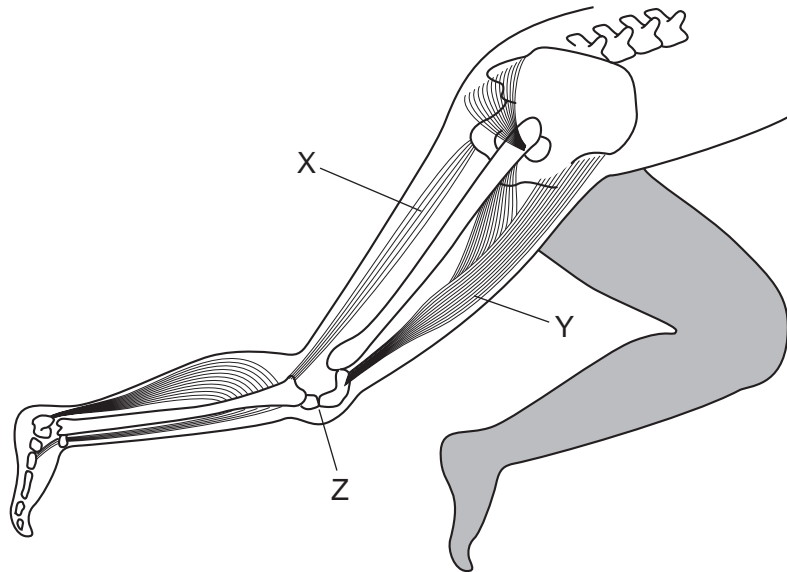
|                  |    |    |    |    |    |    |
|------------------|----|----|----|----|----|----|
| temperature / °C | 15 | 25 | 35 | 45 | 55 | 65 |
| time / seconds   | 35 | 22 | 13 | 5  | 35 | 66 |

At which temperature does the amylase work best?

- A** 15°C      **B** 35°C      **C** 45°C      **D** 65°C
- 16 What does the digestion of starch produce?

- A** fatty acids  
**B** glucose  
**C** mineral salts  
**D** water

17 The diagram shows some bones and muscles in a leg of a human.

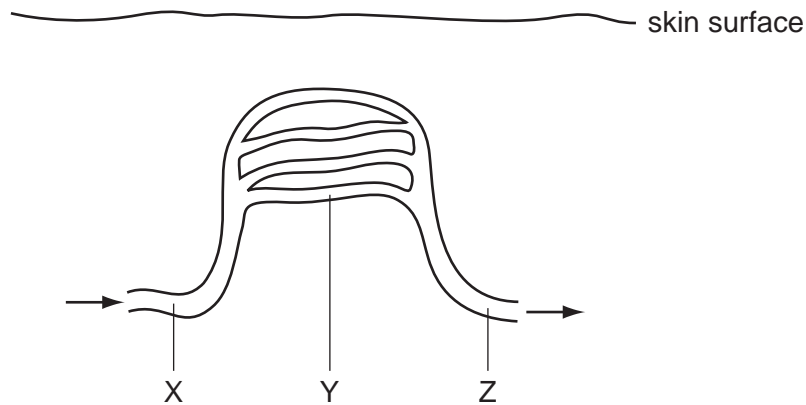


What happens to muscle Y and to the leg at joint Z, when muscle X contracts?

|          | muscle Y  | leg at joint Z |
|----------|-----------|----------------|
| <b>A</b> | contracts | bends          |
| <b>B</b> | contracts | straightens    |
| <b>C</b> | relaxes   | bends          |
| <b>D</b> | relaxes   | straightens    |



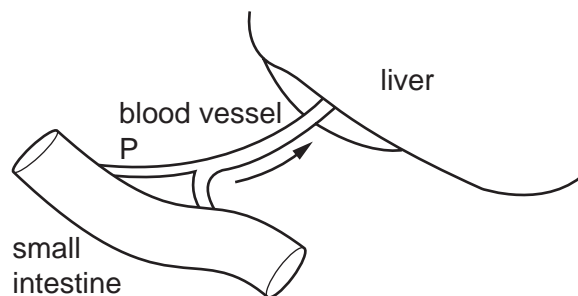
- 18 The diagram shows some blood vessels near the surface of the skin.



If vasoconstriction occurs at X, what happens to the blood flow at Y and Z?

|          | Y         | Z              |
|----------|-----------|----------------|
| <b>A</b> | decreases | decreases      |
| <b>B</b> | decreases | stays constant |
| <b>C</b> | increases | increases      |
| <b>D</b> | increases | stays constant |

- 19 The diagram shows blood vessel P which carries digested food from the small intestine to the liver.



Which row describes the level of glucose in blood vessel P and the level of glycogen in the liver, shortly after a meal containing carbohydrates?

|          | glucose in blood vessel P | glycogen in liver |
|----------|---------------------------|-------------------|
| <b>A</b> | high                      | decreasing        |
| <b>B</b> | high                      | increasing        |
| <b>C</b> | low                       | decreasing        |
| <b>D</b> | low                       | increasing        |

20 How often must a blood cell in the renal artery pass through the heart before it again reaches the renal artery?

- A once
- B twice
- C three times
- D four times

21 What are the properties of an efficient gas exchange system, assuming it has a good blood supply?

- A large surface and thick walls
- B large surface and thin walls
- C small surface and thick walls
- D small surface and thin walls

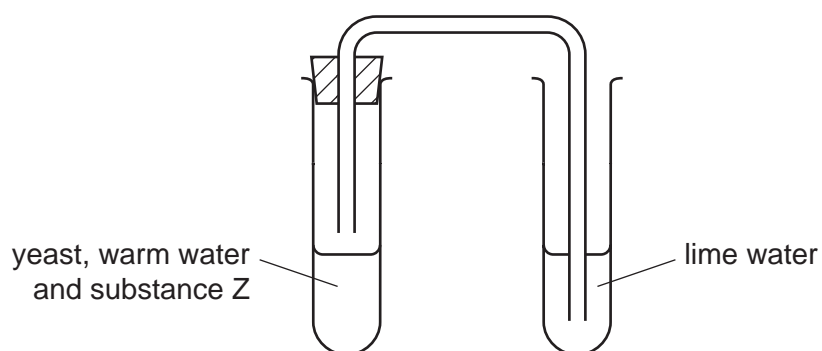
22 What are the effects of smoking on the gas exchange system?

|          | mucus in the airways | chance of lung infection |
|----------|----------------------|--------------------------|
| <b>A</b> | decreased            | decreased                |
| <b>B</b> | decreased            | increased                |
| <b>C</b> | increased            | decreased                |
| <b>D</b> | increased            | increased                |

23 Where do the breakdown of drugs and the storage of urine occur?

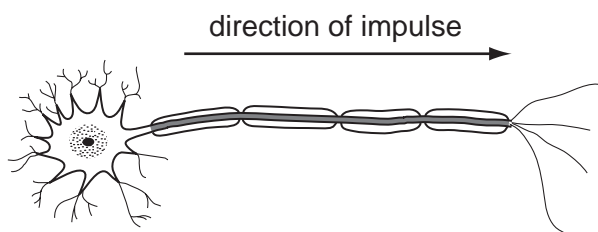
|          | breakdown of drugs | storage of urine |
|----------|--------------------|------------------|
| <b>A</b> | kidney             | muscles          |
| <b>B</b> | liver              | bladder          |
| <b>C</b> | liver              | kidney           |
| <b>D</b> | muscles            | liver            |

- 24 Yeast, warm water and substance Z were put into a test-tube. The apparatus was then set up as shown. After a while, the lime water began to go cloudy.



What is substance Z?

- A alcohol
  - B carbon dioxide
  - C glucose
  - D oxygen
- 25 The diagram shows a neurone carrying an impulse.



Which row describes the type of neurone and the direction of impulse?

|          | type of neurone | direction of impulse      |
|----------|-----------------|---------------------------|
| <b>A</b> | motor           | towards the spinal cord   |
| <b>B</b> | motor           | away from the spinal cord |
| <b>C</b> | sensory         | towards the spinal cord   |
| <b>D</b> | sensory         | away from the spinal cord |

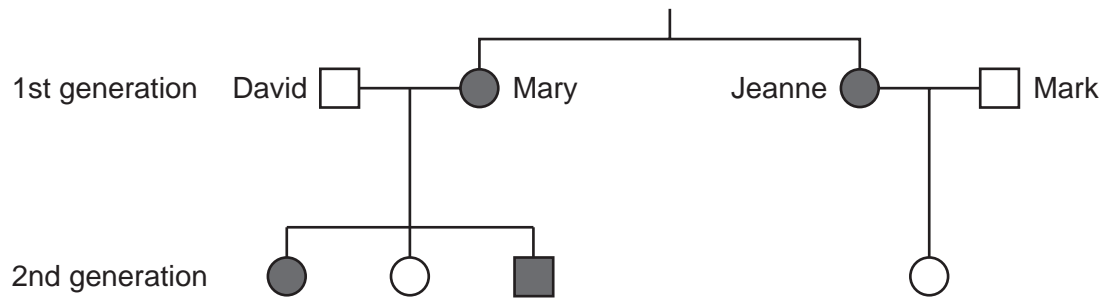
- 26 In some animals, B is the allele for normal skin (without spots) and b is the allele for spotted skin. A pair of these animals has 37 offspring, 18 with spots and 19 without.

What are the most likely genotypes of the parents?

- A** BB × BB
- B** Bb × Bb
- C** Bb × bb
- D** bb × bb

27 The diagram shows a family tree and the inheritance of the ability to taste a certain substance.

The allele for the ability to taste this substance is dominant.



key

represents a male 'taster'

represents a male 'non-taster'

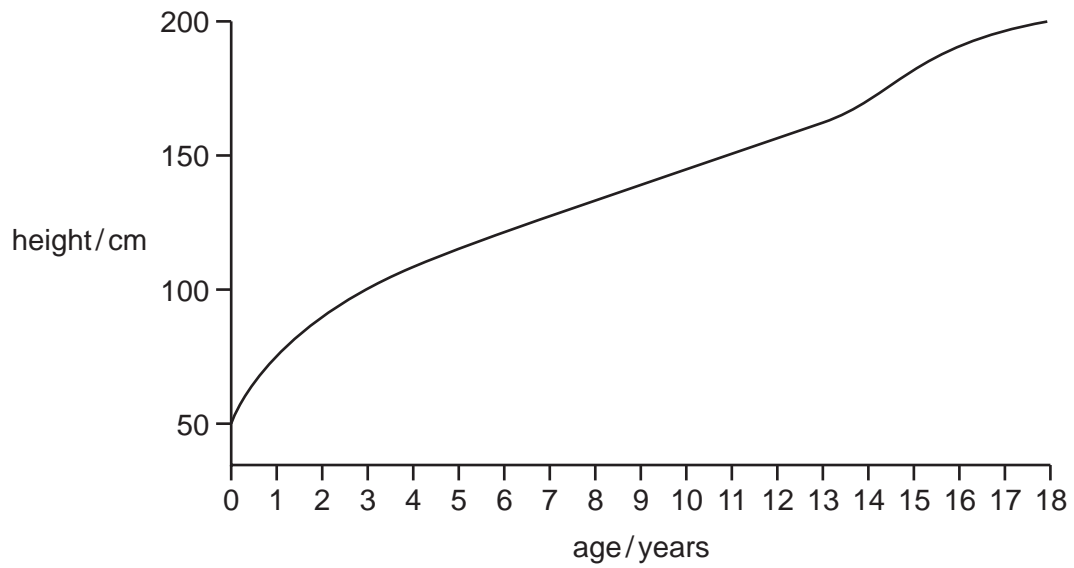
represents a female 'taster'

represents a female 'non-taster'

Which statement about the genotypes of the sisters Mary and Jeanne is correct?

- A Mary is heterozygous and Jeanne is homozygous.
- B Mary is homozygous and Jeanne is heterozygous.
- C They are both heterozygous.
- D They are both homozygous.

28 The graph shows how the height of a child changes with age.



When is the child's growth rate fastest?

- A 0-1 years
- B 3-8 years
- C 14-15 years
- D 16-17 years

29 The calendar shows the menstrual cycle of a woman in September 2008.

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--------|--------|---------|-----------|----------|--------|----------|
|        | 1      | 2       | 3         | 4        | 5      | 6        |
| 7      | 8      | 9       | 10        | 11       | 12     | 13       |
| 14     | 15     | 16      | 17        | 18       | 19     | 20       |
| 21     | 22     | 23      | 24        | 25       | 26     | 27       |
| 28     | 29     | 30      |           |          |        |          |

key

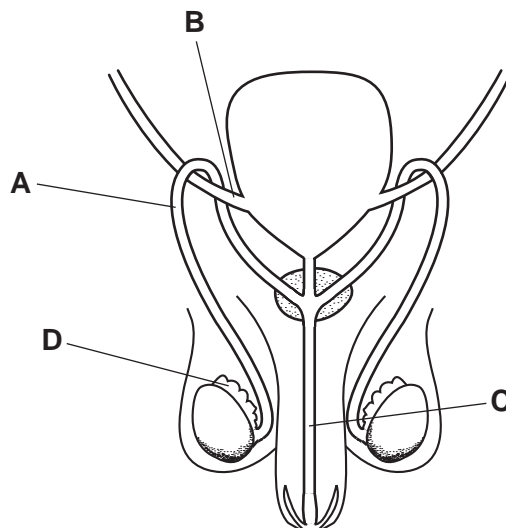
|  |                |
|--|----------------|
|  | = ovulation    |
|  | = menstruation |

Why could fertilisation **not** take place if sperms are released into the vagina on 8th September?

- A Sperms are washed out of the female uterus by the menstrual flow.
- B Sperms can survive in the female reproductive system only for 3 or 4 days.
- C Sperms must be released after ovulation for fertilisation to take place.
- D The uterus lining is washed out of the female body during menstruation.

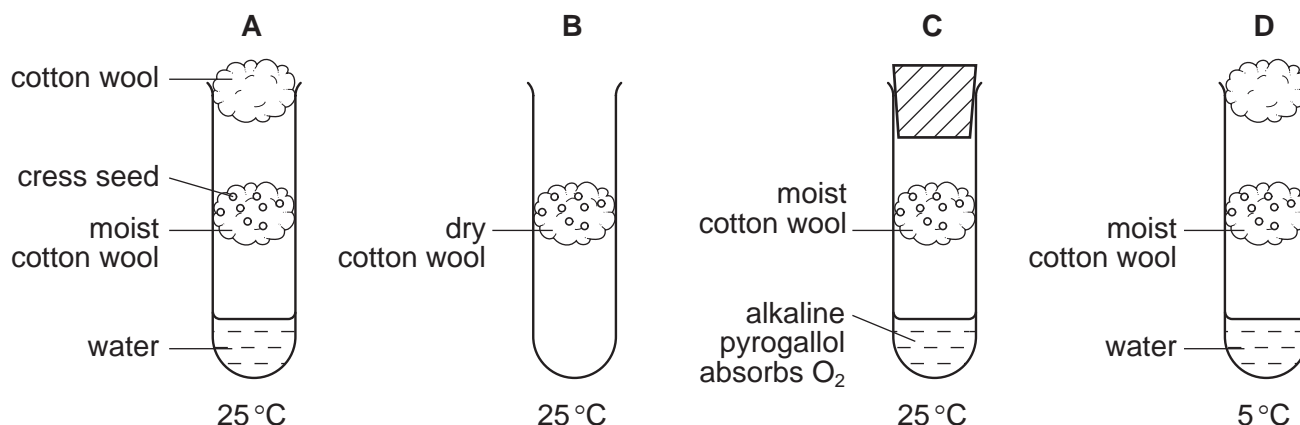
30 The diagram shows some parts of the male reproductive system.

Which part is cut during a vasectomy?



- 31 In an experiment to investigate the effects of various environmental factors on germination, four boiling tubes were set up as shown.

In which tube would the seeds germinate most quickly?



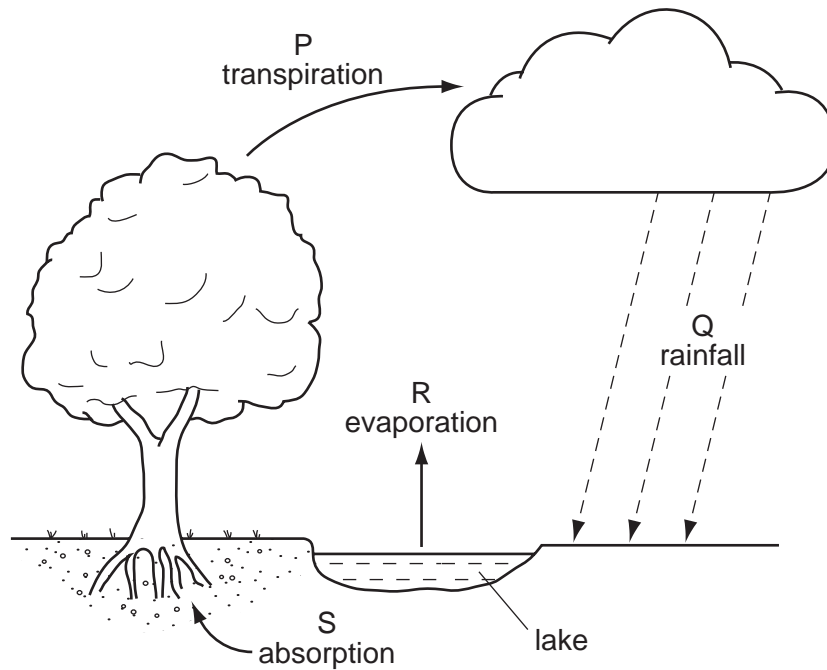
- 32 Which type of reproduction and which type of cell division produces nuclei with half the number of chromosomes?

|          | type of reproduction | type of cell division |
|----------|----------------------|-----------------------|
| <b>A</b> | asexual              | meiosis               |
| <b>B</b> | asexual              | mitosis               |
| <b>C</b> | sexual               | meiosis               |
| <b>D</b> | sexual               | mitosis               |

- 33 What effect does deforestation have on the levels of carbon dioxide, oxygen and water vapour in the atmosphere?

|          | carbon dioxide | oxygen | water vapour |
|----------|----------------|--------|--------------|
| <b>A</b> | less           | less   | more         |
| <b>B</b> | less           | more   | more         |
| <b>C</b> | more           | less   | less         |
| <b>D</b> | more           | more   | less         |

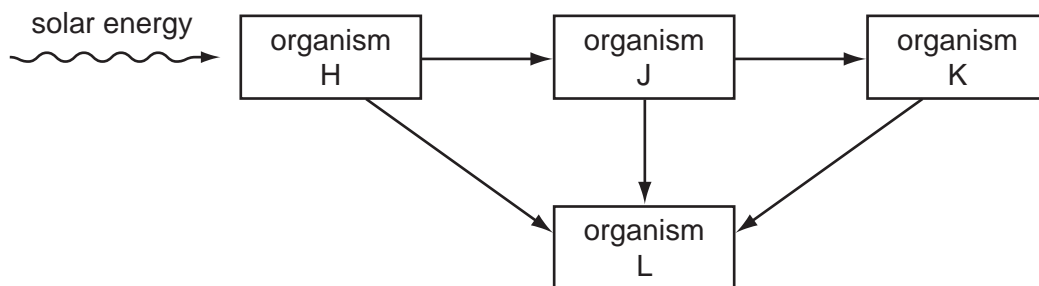
34 The diagram shows part of the water cycle.



Which processes will be slowed down by an increase in humidity?

- A** P and Q      **B** P and R      **C** Q and R      **D** Q and S

35 The diagram shows a simple food web.

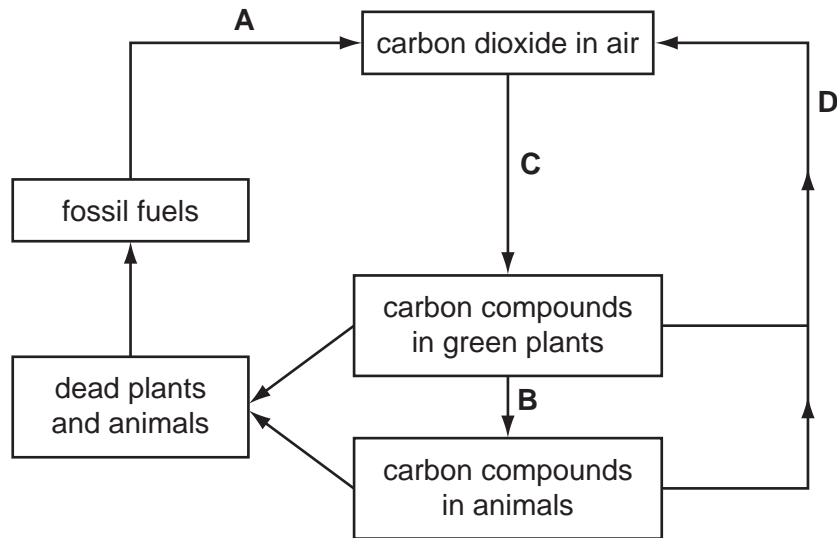


What must organism J be?

- A** a carnivore  
**B** a decomposer  
**C** a herbivore  
**D** a producer



36 Which part of the carbon cycle involves the release of energy from food substances in all living cells?

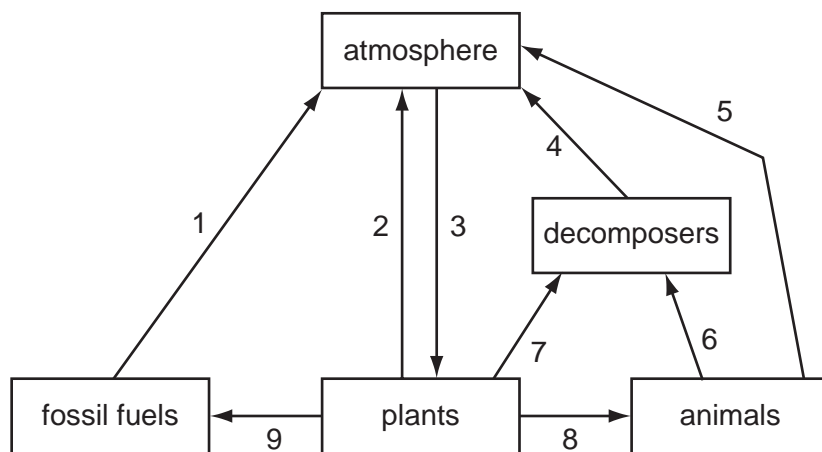


37 A persistent pesticide is one that does not break down.

What is one disadvantage of a persistent pesticide?

- A It becomes more concentrated at each level in the food chain.
- B It breaks down within a few months.
- C It only destroys one particular pest in the food chain.
- D It does not dissolve in water.

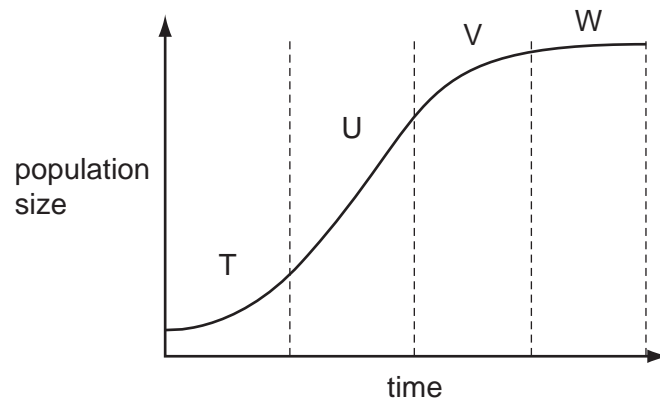
38 The diagram represents the carbon cycle. Processes involved in the circulation of carbon are numbered 1 to 9.



Which processes are parts of a food web?

- A 1, 2 and 3
- B 1, 5 and 8
- C 2, 4 and 9
- D 6, 7 and 8

39 The graph shows the growth of a population in a suitable environment.



During which two stages is the population affected by lack of resources as a limiting factor?

- A** T and U      **B** U and V      **C** V and W      **D** W and T

40 At each stage in a food chain, energy is lost.

What is a result of this?

- A** All living organisms respire.  
**B** Food chains always begin with green plants.  
**C** Plants are called producers and animals consumers.  
**D** There are very few food chains with more than five organisms.



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